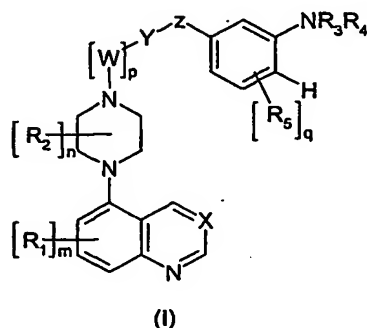


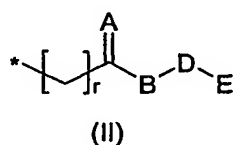
Claims

1. A compound of formula (I) or a pharmaceutically acceptable salt thereof:



wherein:

- R_1 is halogen, cyano, C_{1-6} alkyl, C_{1-6} alkoxy, halo C_{1-6} alkoxy or halo C_{1-6} alkyl;
- m is 0, 1, 2, 3 or 4;
- X is N or CH;
- R_2 is halogen, cyano, C_{1-6} alkyl, C_{1-6} alkoxy, halo C_{1-6} alkoxy or halo C_{1-6} alkyl;
- n is 0, 1 or 2;
- W is $-CH_2-$, $-CH(C_{1-6}alkyl)-$ or $-C(C_{1-6}alkyl)(C_{1-6}alkyl)-$;
- p is 0, 1, 2 or 3;
- Y and Z together form a C_{3-7} cycloalkylene group, or Y is $-CH_2-$, $-CH(C_{1-6}alkyl)-$ or $-C(C_{1-6}alkyl)(C_{1-6}alkyl)-$ and Z is $-CH_2-$, $-CHOH-$, $-CHR_6-$ or $-CR_6R_7-$ (wherein R_6 and R_7 are independently halogen, cyano, C_{1-6} alkyl or C_{1-6} alkoxy);
- R_3 and R_4 are independently hydrogen, C_{1-6} alkyl, C_{1-6} alkylsulfonyl or a group having the formula (II):

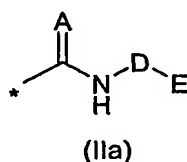


wherein

- r is 0, 1, 2, 3 or 4;
- A is oxygen or sulfur;
- B is a single bond or $-NR_8-$ (wherein R_8 is hydrogen, C_{1-6} alkyl or aryl, wherein the aryl is optionally substituted by one or more substituents independently selected from halogen, oxo, C_{1-6} alkyl, CF_3 , cyano, hydroxy, C_{1-6} alkanoyl, and C_{1-6} alkoxy);
- D is $-(CH_2)_t-$, $-(CH_2)_tO-$ or $-O(CH_2)_t-$, wherein t is 0, 1, 2, 3 or 4; and
- E is C_{1-6} alkyl, halo C_{1-6} alkyl, C_{3-7} cycloalkyl (optionally substituted by one or more substituents independently selected from halogen,

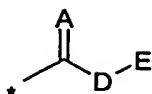
hydroxy, oxo, C₁₋₆alkyl, cyano, CF₃, OCF₃, C₁₋₆alkoxy and C₁₋₆alkanoyl), aryl (optionally substituted by one or more substituents independently selected from halogen, oxo, C₁₋₆alkyl, CF₃, cyano, hydroxy, C₁₋₆alkanoyl and C₁₋₆alkoxy), or E is -NR₉R₁₀, wherein R₉ and R₁₀ are independently selected from hydrogen, C₁₋₆alkyl and aryl (optionally substituted by one or more substituents independently selected from halogen, oxo, C₁₋₆alkyl, CF₃, cyano, hydroxy, C₁₋₆alkanoyl and C₁₋₆alkoxy);

- or R₃ and R₄, together with the nitrogen atom to which R₃ and R₄ are attached, form a 3-7 membered monocyclic heterocyclic group or a 8-11 membered bicyclic heterocyclic group, wherein each group is optionally substituted by one or more substituents selected from halogen, oxo, C₁₋₆alkyl, cyano, CF₃, C₁₋₆alkoxy, C₁₋₆alkanoyl, aryl and arylC₁₋₆alkyl (wherein the aryl and the arylC₁₋₆alkyl are further optionally substituted by one or more halogen, oxo, C₁₋₆alkyl, cyano, CF₃, C₁₋₆alkoxy or C₁₋₆alkanoyl); and
 - R₅ is independently halogen, cyano, C₁₋₆alkyl or C₁₋₆alkoxy; and
 - q is 0, 1, 2, 3 or 4.
2. A compound as claimed in claim 1, wherein n is 0 or n is 1 and R₂ is C₁₋₆alkyl.
 3. A compound as claimed in claim 1 or claim 2, wherein p is 0.
 4. A compound as claimed in claim 1, 2 or 3, wherein Y and Z are independently -CH₂-, -CH(CH₃)- or -CH(OH)-.
 5. A compound as claimed in any of claims 1-4, wherein formula (II) is:



wherein A is oxygen or sulfur, D is -(CH₂)_t-, -(CH₂)_tO- or -O(CH₂)_t-, wherein t is 0, 1, 2, 3 or 4 and E is C₁₋₆alkyl, C₃₋₇cycloalkyl (optionally substituted by one or more substituents independently selected from halogen, hydroxy, oxo, C₁₋₆alkyl, cyano, CF₃, OCF₃, C₁₋₆alkoxy and C₁₋₆alkanoyl), or aryl (optionally substituted by one or more substituents independently selected from halogen, C₁₋₆alkyl, CF₃, cyano, hydroxy, C₁₋₆alkanoyl, and C₁₋₆alkoxy);

or



(IIb)

wherein A is oxygen or sulfur, D is $-(CH_2)_t-$, $-(CH_2)_tO-$ or $-O(CH_2)_t-$, wherein t is 0, 1, 2, 3 or 4 and E is C_{1-6} alkyl, C_{3-7} cycloalkyl (optionally substituted by one or more substituents independently selected from halogen, hydroxy, oxo, C_{1-6} alkyl, cyano, CF_3 , OCF_3 , C_{1-6} alkoxy and C_{1-6} alkanoyl), or aryl (optionally substituted by one or more substituents independently selected from halogen, C_{1-6} alkyl, CF_3 , cyano, hydroxy, C_{1-6} alkanoyl, and C_{1-6} alkoxy).

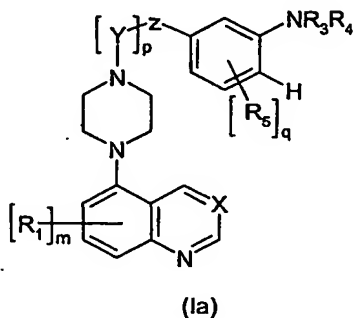
6. A compound as claimed in any of claims 1-5, wherein E is a 5- to 7- membered monocyclic aromatic ring wherein one or more of the carbon atoms in the ring is optionally replaced by a heteroatom independently selected from nitrogen, oxygen and sulfur, wherein the ring is optionally substituted by one or more substituents independently selected from oxo, halogen, C_{1-6} alkyl, CF_3 , cyano, hydroxy, C_{1-6} alkanoyl, and C_{1-6} alkoxy; or E is a 9- to 10- membered bicyclic aromatic ring, wherein one or more of the carbon atoms in the ring is optionally replaced by a heteroatom independently selected from nitrogen, oxygen and sulfur, wherein the ring is optionally substituted by one or more substituents independently selected from oxo, halogen, C_{1-6} alkyl, CF_3 , cyano, hydroxy, C_{1-6} alkanoyl, and C_{1-6} alkoxy.

7. A compound as claimed in any of claims 1-5, wherein E is methylamine, ethylamine, propylamine, isopropylamine, butylamine, isobutylamine, sec-butylamine, tert-butylamine, pentylamine, neopentylamine, sec-pentylamine, n-pentylamine, isopentylamine, tert-pentylamine, hexylamine; dimethylamine, diethylamine, dipropylamine, diisopropylamine, dibutylamine, diisobutylamine, disec-butylamine, ditert-butylamine, dipentylamine, dineopentylamine, dihexylamine, butylmethyamino, isopropylmethyamino, ethylisopropylamino, ethylmethyamino; a monoarylamino such as anilino; or a mono C_{1-6} alkyl-monoarylamino.

8. A compound as claimed in any of claims 1-7, wherein R_3 and R_4 , together with the nitrogen atom to which R_3 and R_4 are attached, form a 4-6 membered monocyclic heterocyclic group optionally substituted by one or more substituents selected from oxo, halogen, C_{1-6} alkyl, cyano, CF_3 , C_{1-6} alkoxy, C_{1-6} alkanoyl, aryl and aryl C_{1-6} alkyl (wherein the aryl and the aryl C_{1-6} alkyl are further optionally substituted by one or more halogen, oxo, C_{1-6} alkyl, cyano, CF_3 , C_{1-6} alkoxy or C_{1-6} alkanoyl); or R_3 and R_4 , together with the nitrogen atom to which R_2 and R_3 are attached, form a 8-10 membered bicyclic heterocyclic group optionally substituted by one or more substituents selected from oxo, halogen, C_{1-6} alkyl, cyano, CF_3 , C_{1-6} alkoxy, C_{1-6} alkanoyl, aryl and aryl C_{1-6} alkyl (wherein the aryl and the

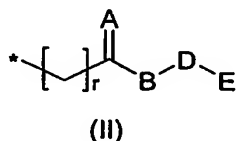
arylC₁₋₆alkyl are further optionally substituted by one or more halogen, oxo, C₁₋₆alkyl, cyano, CF₃, C₁₋₆alkoxy or C₁₋₆alkanoyl).

9. A compound as claimed in claim 1, having a general formula (Ia):



wherein:

- R₁ is halogen, cyano, C₁₋₆alkyl, C₁₋₆alkoxy, haloC₁₋₆alkoxy or haloC₁₋₆alkyl;
- m is 0, 1, 2, 3 or 4;
- X is N or CH;
- p is 1, 2, 3 or 4;
- Y is -CH₂-, -CH(C₁₋₆alkyl)- or -C(C₁₋₆alkyl)(C₁₋₆alkyl)-;
- Z is -CH₂-, -CHOH-, -CHR₆- or -CR₆R₇-, wherein R₆ and R₇ are independently halogen, cyano, C₁₋₆alkyl or C₁₋₆alkoxy;
- R₃ and R₄ are independently hydrogen, C₁₋₆alkyl, C₁₋₆alkylsulfonyl or a group having the formula (II):



wherein:

- r is 0, 1, 2, 3 or 4;
- A is oxygen or sulfur;
- B is a single bond or -NR₈- wherein R₈ is hydrogen, C₁₋₆alkyl or aryl optionally substituted by one or more substituents independently selected from halogen, oxo, C₁₋₆alkyl, CF₃, cyano, hydroxy, C₁₋₆alkanoyl, and C₁₋₆alkoxy;
- D is -(CH₂)_t-, -(CH₂)_tO- or -O(CH₂)_t-, wherein t is 0, 1, 2, 3 or 4; and
- E is C₁₋₆alkyl, haloC₁₋₆alkyl, C₃₋₇cycloalkyl (optionally substituted by one or more halogen, hydroxy, oxo, C₁₋₆alkyl, cyano, CF₃, OCF₃, C₁₋₆alkoxy or C₁₋₆alkanoyl), or aryl (optionally substituted by one or more substituents independently selected from halogen, oxo, C₁₋₆alkyl, CF₃, cyano, hydroxy,

C₁₋₆alkanoyl, and C₁₋₆alkoxy); or E is -NR₉R₁₀ (wherein R₉ and R₁₀ are independently selected from hydrogen, C₁₋₆alkyl and aryl optionally substituted by one or more substituents independently selected from halogen, oxo, C₁₋₆alkyl, CF₃, cyano, hydroxy, C₁₋₆alkanoyl, and C₁₋₆alkoxy);

- or R₃ and R₄, together with the nitrogen atom to which R₃ and R₄ are attached, combine to form a 3-7 membered monocyclic heterocyclic group (optionally substituted by 1 to 4 substituents, which may be the same or different, and which is selected from halogen, oxo, C₁₋₆alkyl, cyano, CF₃, C₁₋₆alkoxy and C₁₋₆alkanoyl);
- R₅ is independently halogen, cyano, C₁₋₆alkyl or C₁₋₆alkoxy; and
- q is 0, 1, 2, 3 or 4.

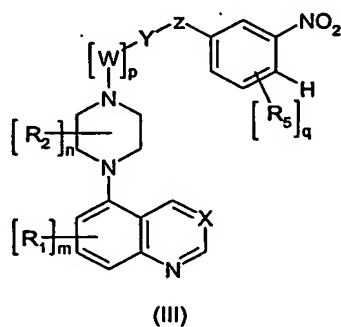
10. A compound as claimed in claim 1, which is:

- 3-(3-{2-[4-(2-methyl-5-quinoliny)-1-piperazinyl]ethyl}phenyl)-1,3-oxazolidin-2-one;
- *N*-(3-{2-[4-(2-methyl-5-quinoliny)-1-piperazinyl]ethyl}phenyl)-*N'*-phenylurea;
- *N*-[2-(methyloxy)phenyl]-*N'*-(3-{2-[4-(2-methyl-5-quinoliny)-1-piperazinyl]ethyl}phenyl)urea;
- 1-(3-{2-[4-(2-methyl-5-quinoliny)-1-piperazinyl]ethyl}phenyl)-2-imidazolidinone;
- 2,4-dimethyl-*N*-(3-{2-[4-(2-methyl-5-quinoliny)-1-piperazinyl]ethyl}phenyl)-1,3-thiazole-5-carboxamide;
- *N*-(3-{1-hydroxy-2-[4-(2-methyl-5-quinoliny)-1-piperazinyl]ethyl}phenyl)-2,4-dimethyl-1,3-thiazole-5-carboxamide;
- 2-fluoro-*N*-(3-{2-[4-(2-methyl-5-quinoliny)-1-piperazinyl]ethyl}phenyl)benzamide;
- 3-(3-{2-[4-(2-methyl-5-quinoliny)-1-piperazinyl]propyl}phenyl)-1,3-oxazolidin-2-one;
- 3-(3-{2-[(2*R*)-2-methyl-4-(2-methyl-5-quinoliny)-1-piperazinyl]ethyl}phenyl)-1,3-oxazolidin-2-one;
- 1-methyl-3-(3-{2-[4-(2-methyl-5-quinoliny)-1-piperazinyl]ethyl}phenyl)-2-imidazolidinone;
- 1-(4-fluoro-3-{2-[4-(2-methyl-5-quinoliny)-1-piperazinyl]ethyl}phenyl)-2-imidazolidinone;
- 3-(4-fluoro-3-{2-[4-(2-methyl-5-quinoliny)-1-piperazinyl]ethyl}phenyl)-1,3-oxazolidin-2-one;
- 1-(3-{2-[4-(2-methyl-5-quinoliny)-1-piperazinyl]ethyl}phenyl)-2,4-imidazolidinedione;
- 1-(3-{2-[4-(2-methyl-5-quinoliny)-1-piperazinyl]ethyl}phenyl)-1,3-dihydro-2*H*-imidazol-2-one;
- 1-methyl-3-(3-{2-[4-(2-methyl-5-quinoliny)-1-piperazinyl]ethyl}phenyl)-1,3-dihydro-2*H*-imidazol-2-one;
- 4,4-dimethyl-1-(3-{2-[4-(2-methyl-5-quinoliny)-1-piperazinyl]ethyl}phenyl)-2-imidazolidinone;

or a pharmaceutically acceptable salt thereof.

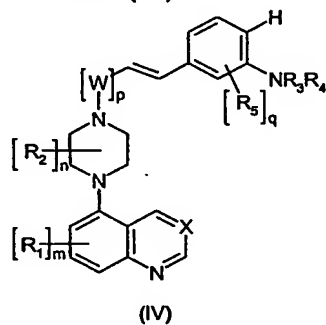
11. A process for the preparation of a compound as claimed in claim 1, which process comprises:

(a) converting a compound of formula (III):



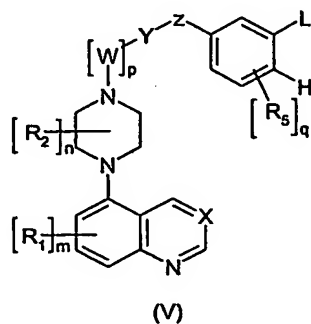
wherein R₁, m, X, R₂, n, W, p, Y, Z, R₅ and q are as defined in claim 1; or

(b) for a compound of formula (I) wherein Y and Z form a cyclopropylene group, converting a compound of formula (IV):

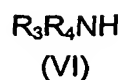


wherein R₁, m, X, R₂, n, W, p, R₃, R₄ and R₅ and q are as defined in claim 1; or

(c) reacting a compound of formula (V):

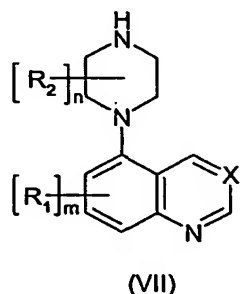


wherein R_1 , m , X , R_2 , n , W , p , Y , Z , R_5 and q are as defined in claim 1, and L is a leaving group, with a compound of formula (VI):

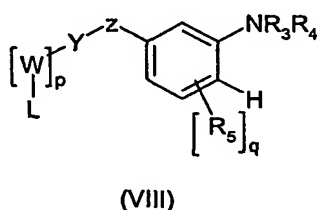


wherein R_3 and R_4 are as defined in claim 1; or

(d) reacting a compound of formula (VII):

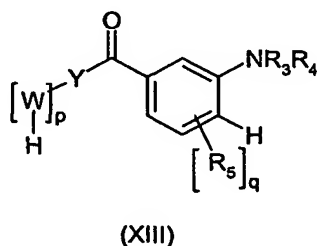


wherein R_1 , m , X , R_2 and n are as defined in claim 1, with a compound of formula (VIII):



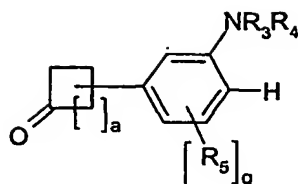
wherein W , p , Y , Z , R_5 , q , R_3 and R_4 are as defined in claim 1, and L is a leaving group; or

(e) for a compound of formula (I) wherein Z is $-CH(OH)-$, reacting a compound of formula (VII) as defined in step (d) with a compound of formula (XIII):



wherein W , p , Y , Z , R_5 , q , R_3 and R_4 are as defined in claim 1; or

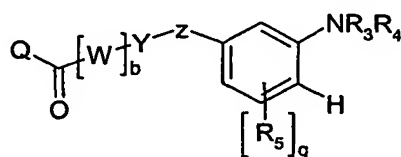
(f) for a compound of formula (I) wherein Y and Z form a C_{3-7} -cycloalkylene group, reacting a compound of formula (VII) as defined above with a compound of formula (XIV):



(XIV)

wherein R_5 , R_2 , R_3 and q are as defined in claim 1 and a is 0, 1, 2, 3 or 4; or

(g) for a compound of formula (I) wherein the group W or Y attached to the nitrogen in the piperazine group in formula (I) is CH_2 or $CH(C_{1-8}alkyl)$, reacting a compound of formula (VII) as defined above with a compound of formula (XV):



(XV)

wherein R_3 , R_4 , R_5 , q , Z , Y and W are as defined in claim 1 and b is 0, 1 or 2 and Q is hydrogen or $C_{1-8}alkyl$;

and thereafter optionally for any of steps (a) to (g):

- removing any protecting groups and/or
- converting a compound of formula (I) into another compound of formula (I) and/or
- forming a pharmaceutically acceptable salt.

12. A compound as claimed in any of claims 1-10 for use as a therapeutic substance.

13. A compound as claimed in any of claims 1-10 for use in the treatment of a CNS disorder.

14. A compound as claimed in claim 13, wherein the disorder is depression or anxiety.

15. A method of treatment of a CNS disorder in a mammal including a human, which comprises administering to the sufferer a therapeutically safe and effective amount of a compound as claimed in any of claims 1-10.

16. A method as claimed in claim 15, wherein the disorder is depression or anxiety.

17. Use of a compound as claimed in any of claims 1-10 in the manufacture of a medicament for use in the treatment of a CNS disorder.
18. Use as claimed in claim 17, wherein the disorder is depression or anxiety.
19. A pharmaceutical composition comprising a compound as claimed in any of claims 1-10, and a pharmaceutically acceptable carrier or excipient.
20. A process for preparing a pharmaceutical composition as defined in claim 19, the process comprising mixing a compound as claimed in any of claims 1-10 and a pharmaceutically acceptable carrier or excipient.